Genetic Probability of a Critter Child

Science

Performance Task

High School

by

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Genetic Probability of a Critter Child

Purpose: This task requires that students design their own genotypes from the phenotypes of an imaginary critter. They will be required to determine the probability of the offspring from two heterozygous parent critters of the phenotype they have determined.

Show-Me Standards Addressed:

Knowledge: M3, Sc 3

Performance: 1.3, 1.6 ,1.8

Grade Level Range: 10 -12

Subject Area: Science

Time Needed for Task: two class periods

Materials Needed: Performance Task Packet (which includes the student prompt, student response sheets, and the scoring guide), pencil, calculator

Instructions for Administration: Distribute the Performance Task Packet and make sure that students understand the directions in the student prompt. Go over the scoring guide so students know what is meant by quality. Students may work alone or with a partner to complete the task.

Pre-Assessment Instructions: Students will need to have prior knowledge of cell structure, mitosis and meiosis, sexual and asexual reproduction, use of Punnett Squares, and how to use and figure percentages and probability.

Genetic Probability of a Critter Child
Student Prompt

This task requires that you use your knowledge of genetics to determine the genotype probability of an offspring critter from two heterozygous parent critters. You will also need to determine the probabilities of all the offspring. Use the student response sheets and follow the process below to complete the task.

1. Determine three main traits that a critter can have.

2. Assume that a heterozygous female and heterozygous male for each of these three traits produce offspring.

3. Randomly choose one offspring genotype.
   Write your selection.

4. Make a Punnett Square to determine the probability of the chosen offspring's genotype.

5. Determine the probability of all possible genotypes.

Genetic Probability of a Critter Child
Student Response Sheet #1

Write three main traits a critter could have.

_____

Assume that a heterozygous female and heterozygous male for each of these three traits produce offspring. Randomly choose one offspring genotype. Write your selection.

_____

Make a Punnett Square to determine the probability of the chosen offspring's genotype.

Genetic Probability of a Critter Child
Student Response Sheet #2

Determine the genotype probability of the chosen offspring

Determine the probability of all possible genotypes.

Genetic Probability of a Critter Child
Scoring Guide

4: Outstanding

The student demonstrates a clear understanding of the technical, scientific, and genetic principles needed to complete the task. The Punnett Square with the probabilities for the chosen offspring have been clearly and accurately stated.

3: Proficient

The student demonstrates an understanding of the technical, scientific, and genetic principles needed to complete the task. The Punnett Square with the probabilities for the chosen offspring have been stated and are, for the most part, accurate. There may be one or two minor errors.

2: Emergent

The student demonstrates a partial understanding of the technical, scientific, and genetic principles needed to complete the task. The Punnett Square with the probabilities for the chosen offspring and have been stated but may be incomplete or contain critical errors.

1: Attempted

The student demonstrates little or no understanding of the technical, scientific, and genetic principles needed to complete the task. The Punnett Square with the probabilities are not stated or are partially stated with many critical errors. The response shows little or no understanding of the task.

0: No Attempt or Off Task